Trend Study 15-4-99

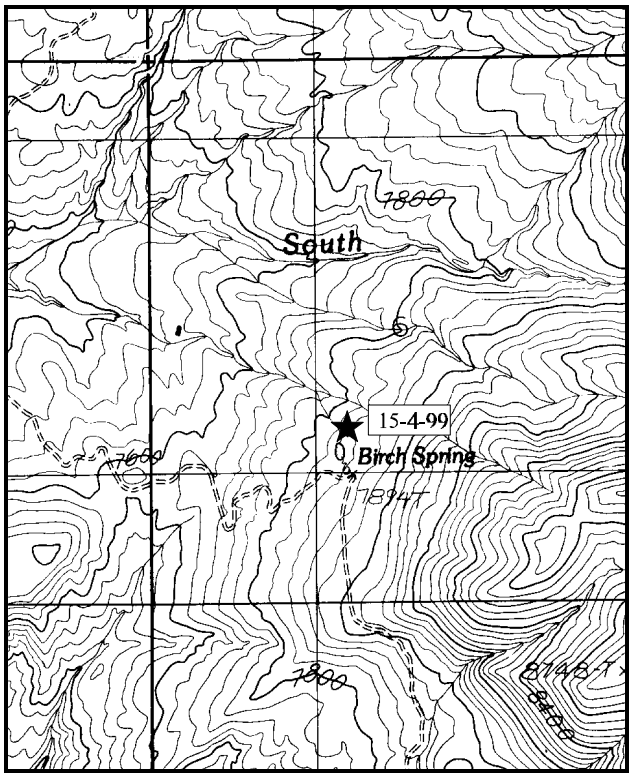
Study site name: South Creek Chaining . Range type: Chained, Seeded P-J .

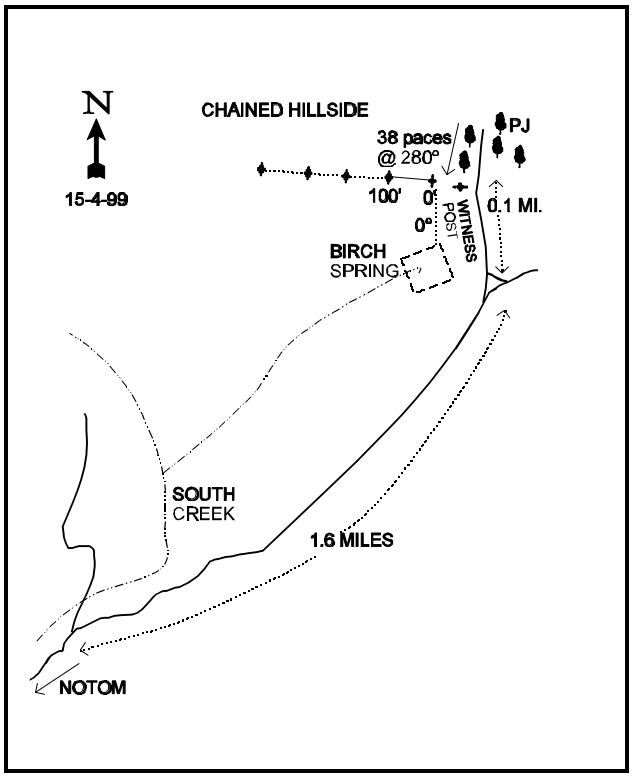
Compass bearing: frequency baseline 275°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From the intersection of the Willow Creek and South Creek Roads, (T32S, R9F, Sec.1) travel 1.5 miles west-southwest to a fork by Birch Spring. Turn left and go 0.1 miles past the fenced spring, and down a faint road. A witness post (tall green fence post) is located in the P-J just west of the road. The transect starts 38 paces away at a bearing of 280°M from the witness post.





Map Name: Mount Ellen Diagrammatic Sketch

Township 32S , Range 10E , Section 6 UTM 4211131.359 N, 513082.932 E

DISCUSSION

Trend Study No. 15-4 (38-4)

The South Creek chaining study is located in the pinyon-juniper foothills on the west slope of the Henry Mountains at an elevation of 7,800 feet. It samples a portion of the South Creek pinyon-juniper project that was completed in the mid-1960's. The study is on a 5% slope that has a northern exposure. Mean annual precipitation is probably between 12 and 14 inches, based on the existing plant community occupying the site. Water is available for livestock and wildlife at Birch Spring a few hundred yards to the south. The site is within the Nasty Flat Cattle Allotment and within a key area for buffalo and mule deer. Pellet group data also indicates a high amount of rabbit use. 1999 pellet group data estimate a moderate level of use on the site with 13 deer and 39 cow days use/acre (32 ddu/ha and 96 cdu/ha). Also, 7 buffalo days use/acre (16 bdu/ha) were estimated at the site. Human use of the area, which could negatively impact wildlife, is minimal. A road skirts the lower edge of the chaining, but it is not heavily traveled. Undulating topography and adequate escape cover buffer wildlife from human disturbances near the road. A lone doe was seen on June 3 when the site was read.

The soil on the site is a dark brown loam of granitic origin, with a neutral pH (6.9). The soil surface is rocky as is the profile, especially the upper 2 decimeters. Penetrometer readings estimated the effective rooting depth to be just over 12 inches. The steeper slopes of the area show pedestaling around grasses and shrubs from overland water flow, however the gentler slopes show minimal erosion occurring. There is a relatively high amount of rock, pavement, and bare ground on the site, but gentle slopes and fairly continuous vegetative cover limit erosion on the site.

Mountain big sagebrush and rubber rabbitbrush are the most abundant browse species on the site. Sagebrush is the key browse at this site. The population has rapidly increased with an estimated 2,740 plants/acre in 1999, up from 160 plants/acre in 1994. Much of this increase comes from the explosion of young plants in the population (1,060 in 1999 compared to 60 in 1994) which greatly increased due to the high number of seedlings that were sampled in 1994 (6,120 seedlings/acre). Currently, an additional 4,560 seedlings/acre were estimated which could result in the further increases of sagebrush if a high proportion of these can persist on the site. Mature sagebrush plants also greatly increased from 100 per acre in 1994 to 1,680 in 1999. The population appears healthy with most plants showing light use and good vigor, with no decadent plants sampled. Rubber rabbitbrush follows closely the pattern of sagebrush. A high number of seedlings sampled in 1994 resulted in an increased number of young plants in 1999, from 760 plants/acre in 1994 to 1,860 plants/acre in 1999. The mature age class also doubled between 1994 and 1999. Decadency is low, vigor good, with 25% of the population showing moderate use. This population looks to be expanding in the future, and may be a cause for concern. Both sagebrush and rabbitbrush had numerous insect galls on the stems in 1999.

Utah serviceberry, snowberry, and true mountain mahogany are also at the site, however none are very abundant with only a single plant of each species being sampled in 1999. Serviceberry and mahogany are heavily utilized due to their infrequent occurrence and preference by browsing animals. The transect is located near the edge of the chaining, where shrub utilization would be expected to exceed that observed for shrubs found toward the interior of the chaining. Serviceberry and mahogany are not classified as key species due to their low abundance.

Crested wheatgrass and alfalfa provide the bulk of the forage found in the chaining. These provide early spring green-up and fall regrowth for wildlife use. Both species had received heavy utilization prior to the time this trend study was established in June of 1987. During the 1994 reading, utilization appeared light. Utilization on crested wheatgrass was not uniform in 1999, with some areas showing little or no use while others showed heavy use. Alfalfa makes up 69% of the forb cover, or 11% of the total vegetative cover at the site. It showed moderate utilization in 1999. This species is decreasing in frequency however, which is most

likely the result of the extended drought. Currently, crested wheatgrass provides 93% of the grass cover, 73% of the herbaceous cover, or 53% of the total vegetative cover. Other grasses and forbs are diverse, but provide little cover and are insignificant.

1994 TREND ASSESSMENT

Protective ground cover has increased on this site indicating a slightly upward soil trend. The decrease in percent litter cover can be partially explained by the fact that the chaining had not been heavily utilized in 1994 which increased total vegetative cover and reduced the amount of visible litter. Browse trend is mixed. Preferred browse have increased slightly in density and show light hedging. On the down side, green rubber rabbitbrush has increased significantly. Overall, the browse trend is slightly down, but if the seedlings of mountain big sagebrush become established, this could change dramatically. The herbaceous understory is dominated by crested wheatgrass and alfalfa. These two species make up 90% of the herbaceous cover. Nested frequency of crested wheatgrass has increased, while that of alfalfa has declined significantly. The decline in alfalfa would be expected with the prolonged drought. Nested and quadrat frequencies of grasses have declined slightly while those of forbs increased significantly. Combined nested frequencies of grasses and forbs have remained stable.

TREND ASSESSMENT
soil - slightly up
browse - slightly down because of the significant increase in green rabbitbrush density
herbaceous understory - stable

1999 TREND ASSESSMENT

Trend for soil is slightly down. Percent cover of bare ground, rock and pavement all increased, while protective ground cover provided by vegetation and litter decreased. Overall trend for browse is slightly down. Trend for sagebrush is up with the increase in density and good recruitment. However, green rubber rabbitbrush density has also greatly increased and recruitment is high, offsetting the upward trend for sagebrush. Trend for herbaceous understory is stable. Sum of nested frequency for perennial species stayed nearly the same with grasses slightly increasing, and forbs slightly decreasing. Crested wheatgrass and alfalfa still dominate the understory. Both are vigorous and provide good forage for wildlife and livestock. Annual species continue to play an insignificant role in the community.

TREND ASSESSMENT
soil - slightly down
browse - slightly down, the increase in mountain big sagebrush being offset by the increase in rubber rabbitbrush
herbaceous understory - stable

HERBACEOUS TRENDS --
Herd unit 15 , Study no: 4

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'87	'94	'99	'87	'94	'99	'94	'99
G	Agropyron cristatum	293	294	294	95	92	92	22.07	20.97
G	Agropyron smithii	$_{ab}$5	$_{a}$-	$_{b}$13	2	-	6	-	.77
G	Bromus tectorum (a)	-	$_{a}$24	$_{b}$57	-	9	22	.26	.63
G	Poa fendleriana	3	1	2	1	1	1	.00	.15
G	Sitanion hystrix	$_{b}$42	$_{a}$4	$_{a}$-	23	2	-	.01	-
Total for Annual Grasses		0	24	57	0	9	22	0.26	0.62
Total for Perennial Grasses		343	299	309	121	95	99	22.08	21.89
Total for Grasses		343	323	366	121	104	121	22.35	22.52
F	Arabis spp.	-	-	2	-	-	1	-	.00
F	Artemisia ludoviciana	3	1	6	1	1	2	.00	.06
F	Astragulus henrimontanensis	7	5	6	4	3	4	.01	.04
F	Casella bursa-pastoris	-	-	3	-	-	1	-	.00
F	Chenopodium album (a)	-	3	-	-	2	-	.01	-
F	Chaenactis douglasii	-	-	2	-	-	1	-	.00
F	Chorispora tenella (a)	-	-	3	-	-	1	-	.38
F	Cirsium vulgare	$_{b}$9	$_{a}$-	$_{a}$-	3	-	-	-	-
F	Cryptantha spp.	-	2	-	-	1	-	.00	-
F	Descurainia pinnata (a)	-	$_{b}$33	$_{a}$9	-	15	3	.10	.04
F	Erigeron spp.	-	-	1	-	-	1	-	.03
F	Hymenoxys acaulis	-	3	2	-	1	1	.00	.00
F	Lappula occidentalis (a)	-	$_{a}$-	$_{b}$64	-	-	31	-	.38
F	Lesquerella kingii	$_{a}$18	$_{b}$43	$_{ab}$42	10	23	21	.29	.25
F	Leucopoa kingii	-	13	-	-	5	-	.07	-
F	Lomatium spp.	$_{a}$-	$_{b}$16	-	-	6	-	.43	-
F	Machaeranthera canescens	1	-	6	1	-	2	-	.18
F	Medicago sativa	$_{b}$110	$_{a}$73	$_{a}$71	47	32	31	6.50	4.38
F	Phlox longifolia	$_{a}$-	$_{b}$13	$_{a}$-	-	6	-	.03	-
F	Polygonum douglasii (a)	-	57	41	-	27	18	.51	.11
F	Sisymbrium altissimum (a)	-	-	2	-	-	1	-	.00
F	Sphaeralcea coccinea	$_{b}$35	$_{ab}$20	$_{a}$17	20	12	8	.14	.11
F	Taraxacum officinale	$_{b}$27	$_{a}$3	$_{b}$21	11	1	12	.00	.38
F	Unknown forb-perennial	6	-	-	2	-	-	-	-
Total for Annual Forbs		0	93	119	0	44	54	0.62	0.92
Total for Perennial Forbs		216	192	179	99	91	85	7.50	5.46
Total for Forbs		216	285	298	99	135	139	8.12	6.38

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 15 , Study no: 4

Type	Species	Strip Frequency '94	Strip Frequency '99	Average Cover % '94	Average Cover % '99
B	Amelanchier utahensis	2	1	-	-
B	Artemisia tridentata vaseyana	7	33	1.30	3.87
B	Cercocarpus montanus	0	1	-	-
B	Chrysothamnus nauseosus graveolens	37	44	1.46	5.48
B	Juniperus osteosperma	0	0	.85	.15
B	Pinus edulis	0	3	1.74	.85
B	Ribes cereum cereum	0	0	.00	-
B	Rosa woodsii	0	0	-	-
B	Symphoricarpos oreophilus	2	2	-	.18
Total for Browse		48	84	5.36	10.55

CANOPY COVER --
Herd unit 15 , Study no: 4

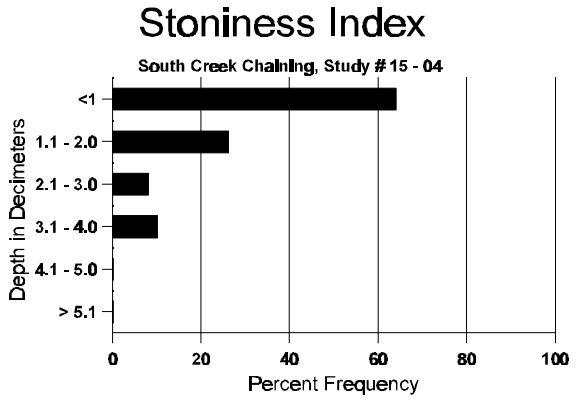
Species	Percent Cover '99
Juniperus osteosperma	1
Pinus edulis	1

BASIC COVER --
Herd unit 15 , Study no: 4

Cover Type	Nested Frequency '94	Nested Frequency '99	Average Cover % '87	Average Cover % '94	Average Cover % '99
Vegetation	327	331	7.25	39.24	38.48
Rock	296	279	12.25	13.10	18.34
Pavement	262	228	9.75	3.17	6.53
Litter	377	354	49.75	22.01	28.75
Cryptogams	4	7	0	.03	.04
Bare Ground	279	279	21.00	10.62	18.14

SOIL ANALYSIS DATA --
Herd Unit 15, Study # 04, Study Name: South Creek Chaining

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
12.4	49.2 (14.1)	6.9	45.6	27.8	26.6	3.7	19.7	156.8	0.7



PELLET GROUP DATA --
Herd unit 15 , Study no: 4

Type	Quadrat Frequency '94	Quadrat Frequency '99	Pellet Transect Days Use/Acre (ha) '99
Rabbit	31	39	N/A
Deer	6	4	13 (32)
Cattle	-	22	39 (96)
Buffalo	12	-	7 (17)

BROWSE CHARACTERISTICS --
Herd unit 15 , Study no: 4

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Amelanchier utahensis																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	87	-	-	2	-	-	-	-	-	-	2	-	-	-	66			2
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	1	-	-	1	-	-	-	2	-	-	-	40	34	55	2
	99	-	-	-	-	-	1	-	-	-	1	-	-	-	20	17	30	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	100%	00%	-39%
'94	00%	100%	00%	-50%
'99	00%	100%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	66	Dec:	-
	'94	40		-
	'99	20		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata vaseyana																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	58	-	-	-	-	-	248	-	-	306	-	-	-	6120			306
	99	228	-	-	-	-	-	-	-	-	228	-	-	-	4560			228
Y	87	-	-	1	-	-	-	-	-	-	1	-	-	-	33			1
	94	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
	99	51	2	-	-	-	-	-	-	-	46	7	-	-	1060			53
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	5	-	-	-	-	-	-	-	-	5	-	-	-	100	16	28	5
	99	74	10	-	-	-	-	-	-	-	82	2	-	-	1680	14	22	84

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	100%	00%	+79%
'94	00%	00%	00%	+94%
'99	09%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	33	Dec:	-
	'94	160		-
	'99	2740		-

Cercocarpus montanus																		
M	87	-	-	2	-	-	-	-	-	-	2	-	-	-	66	8	12	2
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	9	22	0
	99	-	-	-	-	-	1	-	-	-	1	-	-	-	20	9	27	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	100%	00%	
'94	00%	00%	00%	
'99	00%	100%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	66	Dec:	-
	'94	0		-
	'99	20		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus nauseosus graveolens																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	193	-	-	1	-	-	-	-	-	194	-	-	-	3880			194
	99	50	-	-	-	-	-	-	-	-	50	-	-	-	1000			50
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	27	5	2	4	-	-	-	-	-	35	3	-	-	760			38
	99	78	15	-	-	-	-	-	-	-	87	6	-	-	1860			93
M	87	-	1	-	-	-	-	-	-	-	1	-	-	-	33	43	33	1
	94	16	10	1	-	-	-	-	-	-	26	-	-	1	540	22	24	27
	99	33	25	7	-	-	-	-	-	-	65	-	-	-	1300	25	27	65
D	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	99	2	1	-	-	-	-	-	-	-	2	1	-	-	60			3
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	100%	00%	00%	
'94	22%	04%	01%	+98%
'99	25%	04%	00%	+58%

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	33	Dec:	0%
	'94	1340		3%
	'99	3220		2%

Juniperus osteosperma																		
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	100			5

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	0		-
	'99	0		-

Pinus edulis																		
Y	87	2	-	-	-	-	-	-	-	-	2	-	-	-	66			2
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	87	3	-	-	-	-	-	-	-	-	3	-	-	-	100	64	55	3
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	1	-	-	1	-	-	-	-	-	2	-	-	-	40	-	-	2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	166	Dec:	-
	'94	0		-
	'99	60		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Ribes cereum cereum																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	1	-	-	-	-	-	1	-	-	-	20			1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	68	68	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	0		-
	'99	0		-

Rosa woodsii																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	13	9	0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	0		-
	'99	0		-

Symphoricarpos oreophilus																		
S	87	-	1	-	-	-	-	-	-	-	1	-	-	-	33			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	87	-	-	3	-	-	-	-	-	-	3	-	-	-	100			3
	94	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	99	-	-	-	1	-	-	-	-	-	1	-	-	-	20			1
M	87	-	-	2	-	-	-	-	-	-	2	-	-	-	66	13	24	2
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	18	33	0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20	13	21	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	100%	00%	-76%
'94	00%	00%	00%	+ 0%
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	166	Dec:	-
	'94	40		-
	'99	40		-